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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,705	01/19/2007	Katsumi Ichitani	295894US0PCT	3044

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

MCAVOY, ELLEN M

ART UNIT	PAPER NUMBER
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1797

NOTIFICATION DATE	DELIVERY MODE
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01/20/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/591,705	Applicant(s) ICHITANI ET AL.	
	Examiner Ellen M. McAvoy	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5,7-10,12,14-21,23 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5,7-10,12,14-21,23 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on 08 December 2009 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 7-10, 12, 14-21, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hewson et al (6,239,082) in combination with Shimosato et al (2002/0166610).

Applicants' arguments filed 08 December 2009 have been fully considered but they are not persuasive. As previously set forth, Hewson et al ["Hewson"] disclose petroleum quench oil effective for high speed cooling of heated metals and metal hardening, especially steel. The petroleum quench oil contains natural or synthetic base oils having a minimum flash point of about 120°C and having a viscosity between 5 and 100 cSt at 40°C; one such base oil is a solvent refined paraffinic base stock. See column 1, lines 4-42. The petroleum quench oil additionally includes a quench speed accelerator additive system containing (a) a polymer or copolymer

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having alkylene groups such as polyisobutylene in an amount of about 1.5 to 12 vol.%, and (b) a succinic acid or succinic anhydride functionalized polymer or copolymer having alkylene groups in an amount of from about 0.5 to 4.5 vol. %. The examiner is of the position that the petroleum quench oil of Hewson meets the limitations of the claimed quenching oil when the vapor blanket breaking agent is a polyolefin such as polyisobutylene. Applicants' open-ended claim language "comprising" allows for the addition of other additives to the quenching oil such as the succinic acid or succinic anhydride functionalized polymer or copolymer having alkylene groups of Hewson. Applicants' invention differs in amended claim 5 by including the limitation that the pressure on the surface of the quenching oil is reduced to 13-70 kPa in the quenching method. However, as evidenced by Shimosato et al ["Shimosato"], the internal pressure in an oil quenching chamber during a steel work piece oil quenching method may be lowered to 7 to 75 kPa. See [0014].

Response to Arguments

In response, applicants amended independent method claim 5 to contain the limitation of adjusting the pressure on the surface of a quenching oil to 13-70 kPa and argued that the inventors have found that by using a quenching oil composed of a base oil having a kinematic viscosity of a certain value or more blended with a vapor blanket breaking agent and by adjusting the pressure on the surface of the oil under a reduced pressure during quenching, the cooling performance of the oil can be adjusted over a wide range. Applicants argued that by blending the vapor blanket breaking agent with the base oil the vapor blanket stage is shortened under reduced pressure in the present invention thereby resulting in a wider adjustable range of cooling characteristics. Applicants argued that one of ordinary skill would not look to Shimosato for

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guidance in using a base oil comprising a vapor blanket breaking agent as claimed, and that the rejection should be withdrawn.

This is not deemed to be persuasive because the critical “vapor blanket breaking agent” is not set forth in the claims, and no amount of this critical additive is set forth in the claims. In the specification on page 6 suitable vapor blanket breaking agents include a high molecular polymer such as ethylene- α -olefin copolymer, polyolefin, poly-methacrylate, a high molecular weight polymeric organic compound such as asphaltum and the like, and an oil-dispersion type inorganic compound. The specification discloses that “one kind of these vapor blanket breaking agents may be used alone, or in the combination of two kinds or more of them”. An amount of 1-30% by mass may be used.

As previously set forth, Hewson teaches that the petroleum quench oil additionally includes a quench speed accelerator additive system containing (a) a polymer or copolymer having alkylene groups such as polyisobutylene in an amount of about 1.5 to 12 vol. %. The examiner maintains the position that the quench speed accelerator of Hewson meets the limitations of the vapor blanket breaking agent of the claims. As previously set forth, Hewson does not disclose or suggest quenching under reduced pressure conditions as presently claimed. However, the examiner is of the position that the quenching oil composition of the claims may be the same as the quenching oil composition of Hewson, and Hewson also teaches using the oil composition for quenching a metallic material such as steel. As set forth above, Shimosato is added to teach that it is known in the art to lower the pressure on the surface of the quenching oil in a steel workpiece quenching process. The examiner maintains the position that it would have been obvious to the skilled artisan to have followed the teachings in the art and to have used the

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quenching oil composition of Hewson in the quenching process of Shimosato since both of the prior art references are directed towards steel workpiece oil quenching.

Claim Rejections - 35 USC § 103

Claims 5, 7-10, 12, 14-21, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sweet (US 2005/0039832) in combination with Shimosato et al (2002/0166610).

Applicants' arguments filed 08 December 2009 have been fully considered but they are not persuasive. As previously set forth, Sweet et al ["Sweet"] disclose quenching oil compositions comprising (1) a base oil having a kinematic viscosity at 40°C ranging from about 4 to about 45 mm²/s and having a saturated content from about 80% to 100%, (2) an alkali metal salt of saligenin derivative and, optionally, further comprising at least one of (3) an aliphatic polyolefin having a molecular weight ranging from about 300 to about 10,000, (4) a metal salt component, and (5) succinic ester compounds. See page 2, paragraphs [0019] to [0026]. The examiner is of the position that the quenching oil compositions of Sweet meet the limitations of the claimed quenching oil when the vapor blanket breaking agent is a polyolefin. Applicants' open-ended claim language "comprising" allows for the addition of other additives to the quenching oil such as components (2), (4) and (5) of Sweet. Applicants' invention differs in amended claim 5 by including the limitation that the pressure on the surface of the quenching oil is reduced to 13-70 kPa in the quenching method. However, as evidenced by Shimosato, the internal pressure in an oil quenching chamber during quenching may be lowered to 7 to 75 kPa. See [0014].

Response to Arguments

In response, applicants amended independent method claim 5 to contain the limitation of adjusting the pressure on the surface of a quenching oil to 13-70 kPa and argued that the inventors have found that by using a quenching oil composed of a base oil having a kinematic viscosity of a certain value or more blended with a vapor blanket breaking agent and by adjusting the pressure on the surface of the oil under a reduced pressure during quenching, the cooling performance of the oil can be adjusted over a wide range. Applicants argued that by blending the vapor blanket breaking agent with the base oil the vapor blanket stage is shortened under reduced pressure in the present invention thereby resulting in a wider adjustable range of cooling characteristics. Applicants argued that one of ordinary skill would not look to Shimosato for guidance in using a base oil comprising a vapor blanket breaking agent as claimed, and that the rejection should be withdrawn.

This is not deemed to be persuasive because Sweet teaches that the quenching oil composition additionally includes an aliphatic polyolefin having Mn ranging from about 300 to about 10,000 in an amount of about 0.2% to about 5% by weight [0083]. The examiner maintains the position that the polyolefin component of Sweet meets the limitations of the vapor blanket breaking agent of the claims. As previously set forth, Sweet does not disclose or suggest quenching under reduced pressure conditions as presently claimed. However, the examiner is of the position that the quenching oil composition of the claims may be the same as the quenching oil composition of Sweet, and Sweet also teaches using the composition for quenching a metallic material such as steel. As set forth above, Shimosato is added to teach that it is known in the art to lower the pressure on the surface of the quenching oil in a steel workpiece quenching process.

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The examiner maintains the position that it would have been obvious to the skilled artisan to have followed the teachings in the art and to have used the quenching oil composition of Sweet in the quenching process of Shimosato since both of the prior art references are directed towards steel workpiece oil quenching.

Claim Rejections - 35 USC § 103

Claims 5, 7-10, 12, 14-21, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichitani et al (7,347,927) in combination with Shimosato et al (2002/0166610).

Ichitani et al [“Ichitani”] disclose a heat treatment oil composition comprising a mixed base oil containing 50-95 weight % of (A) a low viscosity base oil with a kinematic viscosity of 5-60 mm²/s at 40°C, 50-5 weight % of (B) a high viscosity base oil with a kinematic viscosity of more than 300 mm²/s at 40°C, and (C) a vapor blanket-breaking agent including ethylene-alpha-olefin copolymers, polyolefins and polymethacrylates. See column 1, line 55 to column 3, line 26. The examiner is of the position that the heat treatment oil composition of Ichitani meets the limitations of the claimed quenching oil. Applicants’ open-ended claim language “comprising” allows for the addition of other additives to the quenching oil such as the high viscosity base oil of Ichitani. Applicants’ invention differs in amended claim 5 by including the limitation that the pressure on the surface of the quenching oil is reduced in the quenching method. However, as evidenced by Shimosato, the internal pressure in an oil quenching chamber during quenching may be lowered to 7 to 75 kPa. See [0014].

Response to Arguments

In response, applicants amended independent method claim 5 to contain the limitation of adjusting the pressure on the surface of a quenching oil to 13-70 kPa and argued that the inventors have found that by using a quenching oil composed of a base oil having a kinematic viscosity of a certain value or more blended with a vapor blanket breaking agent and by adjusting the pressure on the surface of the oil under a reduced pressure during quenching, the cooling performance of the oil can be adjusted over a wide range. Applicants argued that by blending the vapor blanket breaking agent with the base oil the vapor blanket stage is shortened under reduced pressure in the present invention thereby resulting in a wider adjustable range of cooling characteristics. Applicants argued that one of ordinary skill would not look to Shimosato for guidance in using a base oil comprising a vapor blanket breaking agent as claimed, and that the rejection should be withdrawn.

This is not deemed to be persuasive because the heat treatment oil composition of Ichitani meets the limitations of the claimed quenching oil which contains a vapor blanket breaking agent. As set forth above, Shimosato is added to teach that it is known in the art to lower the pressure on the surface of the quenching oil in a steel workpiece quenching process. The examiner maintains the position that it would have been obvious to the skilled artisan to have followed the teachings in the art and to have used the quenching oil composition of Ichitani in the quenching process of Shimosato since both of the prior art references are directed towards steel workpiece oil quenching.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ellen M. McAvoy whose telephone number is (571) 272-1451. The examiner can normally be reached on M-F (7:30-5:00) with alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ellen M McAvoy/
Primary Examiner
Art Unit 1797

EMcAvoy
January 14, 2010